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Acerocnema macrocera (Meigen, 1826), a new genus and species for Belgium and the Netherlands (Diptera: Scathophagidae)

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Abstract

The dung fly *Acerocnema macrocera* (Meigen, 1826) is reported for the first time from both Belgium and the Netherlands. This remarkable species has a strict relationship with its host plants, *Corydalis solida* (Fumewort) and *Corydalis cava* (Stagger weed), two plants of which fruits are used to deposit eggs. Although reported as new, the species may have been present in both countries for a long time, but has been overlooked. The species is caught only occasionally due to the small size, early phenology and atypical habitat.

Keywords: Scathophagidae, Belgium, the Netherlands, *Corydalis*, new species, host-plant interaction

Résumé

Acerocnema macrocera (Meigen, 1826) est signalée pour la première fois de Belgique ainsi que des Pays-Bas. Cette espèce remarquable a une étroite relation avec ses plantes hôtes, *Corydalis solida* (Corydale à bulbe plein) et *Corydalis cava* (Corydale à tubercule creux), deux plantes dont les fruits sont utilisés pour déposer les œufs. Bien que signalée comme nouvelle, l'espèce est sans doute présente depuis longtemps dans les deux pays mais n'avait pas été encore détectée. L'espèce n'est que rarement capturée en raison de sa petite taille, de sa phénologie précoce et de son habitat atypique.

Samenvatting

De strontvlieg *Acerocnema macrocera* (Meigen, 1826) wordt hier voor de eerste keer gemeld uit zowel Nederland als België. Deze merkwaardige soort heeft een strikte relatie met z'n waardplant, *Corydalis solida* (Vingerhelmbloem) en *Corydalis cava* (Holwortel), waar eitjes op de vruchten afgezet worden. Hoewel de soort als nieuw gerapporteerd wordt, is deze wellicht reeds lang aanwezig in beide landen. Ze wordt slechts zelden gevangen door haar klein formaat, vroege vliegtijd en atypische habitat.

Introduction

The family Scathophagidae is a small family, known from 407 species worldwide (BALL, 2014), of which 220 occur in the Palaearctic region (ŠIFNER, 2008). In the Netherland this family is represented by 41 species (DE JONG, 2002) and in Belgium it is represented by 56 species (GOSSERIES, 1991), although this last number is an overestimation due to recent taxonomic changes. Despite the low species richness, species of this family are often hard to identify due to the old and small amount of identification literature.

The name 'dung flies' makes the family quite unpopular with entomologists, but in fact, only some species of the genus *Scathophaga* are associated with animal excrements. Larvae of most species are phytophagous: leaf miners, seed and stem borers. Predacious and saprophagous larvae are known too (PÜCHEL-WIELING, 2008). Adults are predators of small insects and occasionally feed on nectar

(ŠIFFNER, 2009). The family has an interesting distribution, occurring mainly in the Holarctic with only few exceptions. More species are found at high, northern latitudes compared to lower, southern latitudes (GORODKOV, 1986).

Results

MATERIAL EXAMINED.

The first records originate back to spring 2012, when several unknown Scathophagidae were seen feeding, mating and ovipositing on *Corydalis solida* in Spa (Belgium). Frank Püchel-Wieling identified these flies as *Acerocnema macrocera*. In spring 2014, several field trips conducted in *Corydalis*-rich woodland resulted in three more localities in the neighbourhood of Maastricht (both in Belgium and the Netherlands). At last, over 1.500 pictures of the host plant *Corydalis,* accessible through the observation platforms www.waarnemingen.be and www.waarneming.nl, were checked by the first author in order to find the flies. In two pictures, *Acerocnema* were visible on the fruits, resulting in another two records.

Most material reported in this paper has not been collected and was identified from pictures only, except in one Belgian and one Dutch locality specimens have been collected to examine genitalia.

26.III.2012, Spa, 12♂ + 4♀, leg. Devillers C. det. Püchel-Wieling F.; 27.III.2012, Spa, 1♂, leg. Devillers C. det. Püchel-Wieling F.; 13.IV.2013, Spa, 2♂, leg. Devillers C. det. Mortelmans J.; 14.IV.2013, Spa, 1♀ + 5♂, leg. Devillers C. det. Mortelmans J.; 16.IV.2013, Spa, 1♀ + 5♂, leg. Devillers C. det Püchel-Wieling F.; 19.IV.2013,Spa, 3♀ + 5♂, leg. Devillers C. det. Mortelmans J.; 20.IV.2013, Spa, 3♀ + 5♂, leg. Devillers C. det. Mortelmans J.; 22.IV.2013, Spa, 2♀ + 3♂, leg. Devillers C. det. Mortelmans J.; 24.IV.2013, Spa, 1♀, leg. Devillers C. det. Mortelmans J.; 1.V.2013, Hohnbach (Kelmis), 1?, leg. Bruggeman C. det. Mortelmans J.; 11.III.2014, Leuven, 1?, leg. Gyselinck T. det. Mortelmans J.; 19.III.2014, Spa, 3♂, leg. Devillers C. det. Mortelmans J.; 29.III.2014, Spa, 11♂, leg. Devillers C. det. Mortelmans J.; 7.IV.2014, Bunderbos, 1♀ + 1♂, leg. Mortelmans J. det. Mortelmans J. col. Mortelmans J.; 8.IV.2014, Lanaye, 1♂, leg. Mortelmans J. det. Mortelmans J. col. Mortelmans J.; 9.IV.2014, Savelsbos, 1♀, leg. Mortelmans J. det. Mortelmans J.

Recognition of the species

The genus *Acerocnema* is characterised by the combination of one sternopleural bristle, unmarked wings (slightly yellowish at base), no specific bristles on front leg (compare to e.g. *Norellisoma*), scutellum with four bristles (two pairs), both ocellar and orbital bristles present, palpi broadly flattened and 3th segment of antennae nearly reaching oral margin. *Acerocnema* are exceptionally small Scathophagidae comparing to other species.

Currently five species are known. Three species (*Acerocnema barkalovi* Ozerov, 2006; *Acerocnema lobanovi* Ozerov, 2006; *Acerocnema arctica* Ozerov, 2013) are known from the east Palearctic only. The fourth, *Acerocnema paradoxopyga* Stackelberg, 1952, is known from the European part of Russia. The fifth, *Acerocnema macrocera* (Meigen, 1826) is known from a wide range of European countries (see 'Distribution').

Based on its distribution, there is little doubt about identification of the photographed specimens. From one Dutch and one Belgian locality, specimens were collected in order to check genitalia (compared to GORODKOV, 1988). All collected material appeared to be indeed *A. macrocera.*

Figs 1-3. *Acerocnema macrocera* on *Corydalis solida*. 1. Two male specimens on flowers. 2-3. Female specimens ovipositing on fruits (Photo: Christine Devillers).

Ecology

All specimens reported here were observed on *Corydalis solida*, the species is without doubt linked to this host plant, as suggested by PÜCHEL-WIELING, 2008. On many occasions egg deposit was seen on the fruits of *Corydalis*. Abroad, the species was always seen in forests which is consequent with the observations discussed here. At one Belgian locality, *Acerocnema* was seen in a public park in the city centre of Leuven, indicating that the species is probably not related to forest, but primarily related to its host plant. At the two Dutch locality, *Acerocnema* was sought on other spring flora than *Corydalis* (e.g. *Anemone nemorosa, Ficaria verna*) but not found. From abroad also other species of *Corydalis* are mentioned to host *Acerocnema* (e.g. *Corydalis cava*, PÜCHEL-WIELING, 2008).
Here, a parasite on the eggs of *Acerocnema* is observed. Field observations showed the eggs to be parasitized by an unidentified Ichneumonidae (Opiinae).

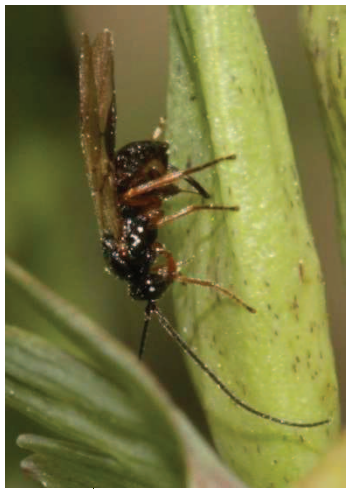

Fig. 4. Freshly laid *Acerocnema* eggs were parasitized by an Ichneumonidae (Opiinae) (Photo: Christine Devillers).

Phenology

The species is active in early spring. In Belgium and the Netherlands, the first record is dated 11th of March and the last record is on the 1th of May. A phenology for all currently known specimens is visualized in Fig. 5.

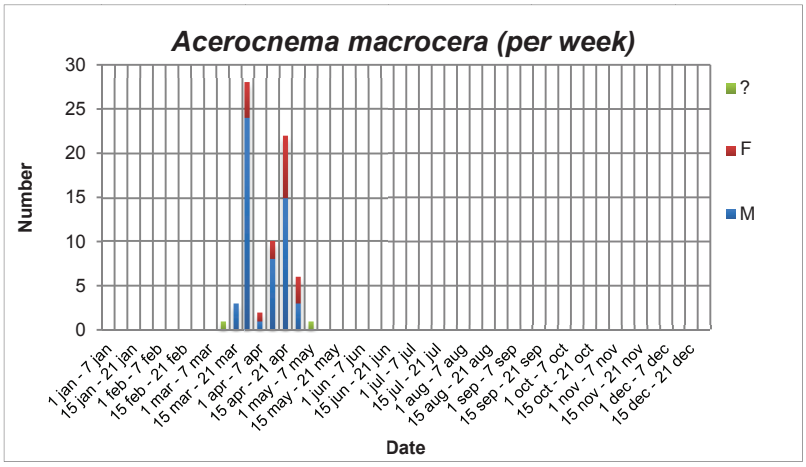

Fig. 5. Phenology of *Acerocnema macrocera* in Belgium and the Netherlands. Male specimens indicated in blue, female specimens indicated in red, specimens of which sex could not be determined indicated in green.

Fig 6. Distribution map of Belgian and Dutch localities of *A. macrocera*.

Distribution

Acerocnema macrocera is known from a wide range of European countries. The catalogue of ŠIFNER, 2008 lists Austria, Czech Republic, Denmark, Finland, Germany, Hungary, Italy, Poland, Slovakia, Sweden. Now, Belgium and the Netherlands are added to this list.

The species is known from four Belgian and two Dutch localities, five of these very close together. Without doubt, the species is present in other neighbouring countries (France, Luxembourg and even Great Britain). For the narrow host relationship, and the apparently loose affinity to the habitat (e.g. Leuven location) it is suggested that *Acerocnema* can be found on most localities where *Corydalis* is present in good numbers.

Acknowledgements

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